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Water Survey of Canada: Application for Use of ERTS-A for Retransmission of Water Resources Data

R.A. Halliday

Applied Hydrology Division
Department of the Environment
Ottawa, Ontario, Canada
K1A 0E7

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Type I Report for the Period April - September 1974.

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14. Supplementary Notes

Report prepared by I.A. Reid and R.A. Halliday.

15. Abstract

Nine Data Collection platforms have been installed at Water Survey of Canada gauging stations for retransmission of water resources data. Six are operating normally while the other three are in various stages of repair.

Data are available from the Canada Centre for Remote Sensing on a near real time basis. Expansion of the network to 28 installations is in progress.

Type I Progress Report for
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1. Accomplishments

a) DCP 6137 was moved upstream from the Winisk River below Asheweig River Tributary to a new site on the Winisk River at Kanuchuan Rapids (Latitude 50° 57', Longitude 87° 42') on September 27, 1974. Some problems with vandals had taken place at the former location. An air depolarized carbon zinc battery (manufactured by Cipel & Le Carbonne, France) was installed as the DCP power supply. According to the manufacturer the battery has good low temperature characteristics and should last about five years. The cells are not rechargeable. A battery voltage sensor and recorder operation check device was also installed. The DCP did not transmit at the new site. (See Section 2. Major Problems)

b) A solid state timer (manufactured by ComDev Marine, Ottawa) was tested for use with the Memomark II water level encoder. The timer has good low temperature characteristics and will provide contact closures at 5, 15, 30 or 60 minute intervals. Accuracy is about one minute per month. Chelsea Model TF-3 timers have also been ordered for testing and evaluation.

2. Major Problems

a) After about two years of trouble free operation, some DCPs apparently, are starting to fail. DCP 6260 had a massive failure that was described in the last Type I report. This platform was repaired at Ball Brothers Research, Boulder, Colorado and is ready to be put back in service.

DCP 6137 did not transmit after installation at a new site. On opening the case, it was discovered that the anodizing material had peeled off the transmitter board and appeared to be clinging to the board electrostatically. It seems possible that the transmitter could have been shorted out by some of this material. Further information on the failure is not available at this time.

DCP 6232 ceased to transmit at a time when modifications to the sensor package were being carried out. Cause of the failure is not known at this time.

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b) Some problems have been encountered with the Telex readout of DCS data from the computer at the Canada Centre for Remote Sensing by western District offices. It seems as if the 2000 to 3000 mile distances to Calgary and Vancouver has an effect on the land line connections.

c) On June 26, 1974, an additional 19 DCP identification numbers were requested in order to develop the quasi-operational aspects of the Canadian network. No response to this request has been received from NASA.

3. Significant Results

a) The fact that water resources data can be retransmitted from remote areas of Canada by polar orbiting spacecraft to users in population centres on a near real time basis reliably, accurately and at relative low cost continues to be demonstrated. Over 60,000 transmissions from the 9 DCPs installed at Water Survey of Canada gauging stations have been received.

b) Figure One illustrates one aspect of the experiment. The stage and "ice-out" data retransmitted via ERTS are plotted on the chart record produced by a water stage servo-manometer installed on the Albany River. The stage increases smoothly until shortly after noon on May 19, 1974. During this time the indicator shows that the ice surface is intact. The stage then drops sharply and the indicator reads that the ice is out. The erratic chart trace after that is consistent with the assumption that the ice surface has broken up and that some short duration jams of broken ice are occurring.

4. Significant Changes in Operating Procedures

During this report period, there has been no significant changes in operating procedures.

5. Published Articles or Papers

During this report period, there has been no articles or papers published.

6. Recommendations

The Data Collection System carried by ERTS-1 and the ground data handling facilities should be maintained until complete failure of the spacecraft.

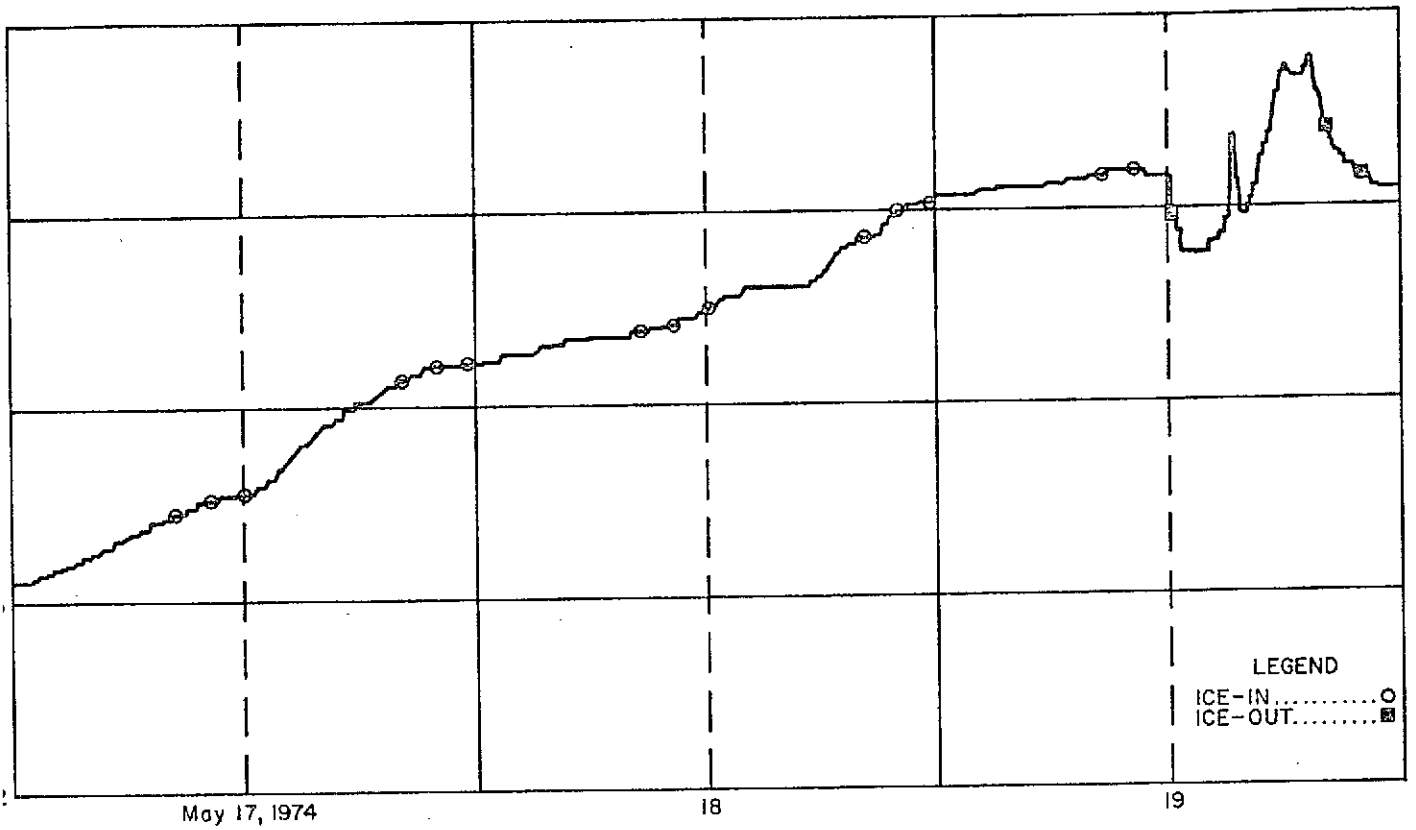

FIGURE 1. TRACE OF ALBANY RIVER ABOVE NOTTIK ISLAND WATER LEVEL RECORDER CHART, MAY 17 to 19, 1974

Future Plans

The ERTS-B Technical Proposal dated January 15, 1973, described the Water Survey of Canada's proposed use of 14 Data Collection Platforms to obtain water level and associated data. The revised Technical Proposal dated November 28, 1973 develops the quasi-operational aspects of the January 15, 1973 proposal and indicates a further expansion of the DCP network.

A network of 28 Data Collection Platforms in widely dispersed remote areas of Canada is nearing reality. Data users in several Canadian cities will be provided with near real time data for water management purposes. The costs of the system will be compared with those of land line telemetry, where possible, and the benefits of obtaining real time data from the remote sites will be evaluated.